

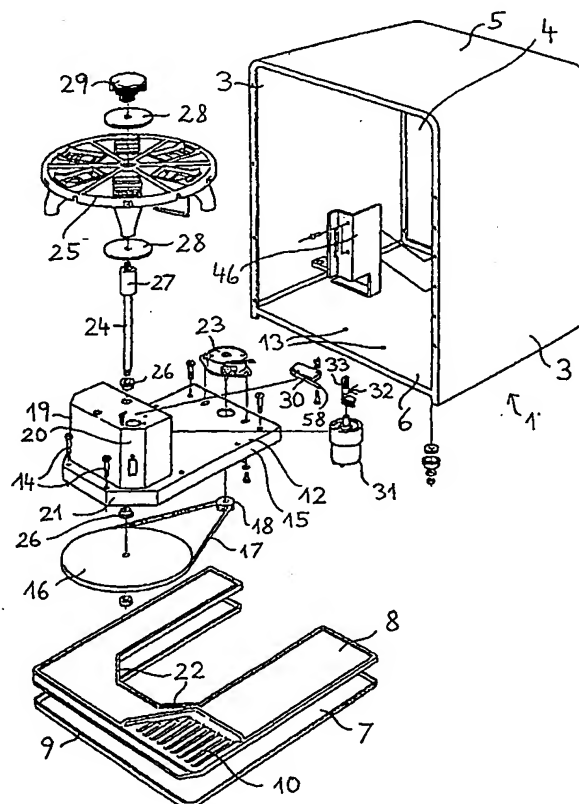


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/SE99/01918 <b>(22) International Filing Date:</b> 25 October 1999 (25.10.99) <b>(30) Priority Data:</b> 9803769-0      4 November 1998 (04.11.98)      SE <b>(71) Applicant (for all designated States except US):</b> JEDE AB [SE/SE]; P.O. Box 303, S-542 23 Mariestad (SE). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> EKLIND, Evert [SE/SE]; P.O. Box 1515, S-542 64 Mariestad (SE). <b>(74) Agent:</b> SIEBMANN, H.; Gotapatent AB, P.O. Box 154, S-561 22 Huskvarna (SE).		<b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> <i>In English translation (filed in Swedish).</i>

**(54) Title:** BEVERAGE DISPENSER**(57) Abstract**

The invention relates to a beverage dispenser (1), which comprises a house (2-6) and disposed in the house optionally selectable packages with ingredients for making beverages. The ingredients will be dispensed in cups via dosing mechanisms (35) having shuttles (34) designed to be moved to and from, a certain amount of ingredients being dispensed in this way. According to the invention the dosing mechanisms (35) with the corresponding packages are disposed in a star-like fashion, on and in respectively a motor-driven rotating plate (25), the shuttles (34) are each one provided with two mainly transverse carrier walls (44), defining there between a guide gap (45), into which a crank (33) is to be inserted by means of a crank shaft (32), which belongs to a dosing motor (31) and in all the shuttles (34) at least one of the carrier walls (44) and the guide gaps (45) respectively follow circular paths, which are concentric in relation to the hub (37) of the rotating plate (25).



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**BEVERAGE DISPENSER**

The present invention relates to a beverage dispenser of the type described in detail in the preamble of claim 1.

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Known dispensers in this field suffer from various inconveniences . Thus, it may be impossible or difficult, e.g. be very complicated and/or take up a lot of space and/or be costly, to obtain a variable beverage composition, e.g. a relatively strong but only slightly sweetened cup of coffee with or without a cream substitute and to accomplish a quick and simple replacement of cartridges with  
10 beverage ingredients respectively. Also, the reliability, the sanitation and the life of the already known dispensers are problematic.

The object of the present invention it to improve the beverage dispensers already known in this field, in order to avoid the above-mentioned inconveniences to the greatest possible extent. Also,  
15 the object of the invention is to in additional respects develop the state of the art in this field.

These objects are attained according to the invention by designing a beverage dispenser of the type described in the introduction mainly in the way set forth in the characterizing clause of claim 1.

20 Additional characterizing features and advantages of the invention are set forth in the following description, reference being made to the enclosed drawings, which partly schematically show a few preferable but not limiting embodiments of the invention and in detail show in:

Fig 1 an exploded view of a beverage dispenser according to the invention, without its front side, which has been removed for better lucidity;

25 Fig 2 the beverage dispenser according to Fig 1 in a similar exploded view, provided with its front side but without the interior components shown in Fig 1;

Fig 3 a rotating plate, which is a component of the dispenser according to Fig 1 and is seen in a perspective view from above; and

30 Fig 4 the rotating plate according to Fig 3, seen in a perspective view from below.

The beverage dispenser according to the present invention is in its entirety designated 1. It has a house, which comprises a front side 2, side walls 3, a back side 4, a top side 5, and a bottom side 6. The various sides can, if it is desirable, be made in arbitrary combinations in one piece of e.g. a  
35 plastic material and/or metal sheet. Side walls 3, top side 5 and bottom side 6 can e.g. according to

Fig 1 be made as a homogenous unit, to which the front side and the back side can be fastened e.g. by screwing.

According to Fig 1 the interior of the dispenser comprises from below and upwards first of all a lower U-shaped drip tray 7 for liquid and above this a similar upper tray 8 for powder or granulate waste. Tray 7 is supported by bottom side 6 and tray 8 is supported by an upwardly directed edge 9, which surrounds tray 7. Tray 8 comprises an e.g. latticed bar-like surface 10 to place cups or the like on (not shown), which cups can be inserted through an opening 11 in front side 2.

The two trays 7, 8 surround with their legs and their web a shape-complementarily enclosed base plate 12, which can be fastened by screws 14 in holes 13 in bottom side 6. This plate has a substantial thickness, because its sides 15 are downwardly bent. In this way space is available for e.g. nuts, screws and the like but also for a driving pulley 16, disposed in a horizontal plane and having a relatively large diameter, which pulley is driven via e.g. a belt 17 by means of a drive gear 17 having a relatively small diameter. Driving pulley 16 is disposed immediately behind front side 2, whereas drive gear 18 is disposed immediately behind back side 4. Due to said diameter relation an advantageous gear ratio and a satisfactory use of the tractive power is obtained.

On top of base plate 12 there is an additional structure 19 at a short distance behind front side 2, which is relatively high, i.e. about 15 cm, and which is somewhat displaced inwards but follows the outline of the base plate within this area, the edges facing the front side having been replaced with bevels 20, which are used also at 21 and 22 of base plate and trays 7 and 8 respectively. These bevels result in an expedient design and an improved stability of the parts mentioned.

A driving motor 23 for drive gear 18 is centrally disposed on the rear part of the base plate, whereas a from driving pulley 16 upwardly directed spindle 24 is centrally disposed within said additional structure, which spindle transfers the rotation of the pulley to a rotating plate 25, disposed on top of said additional structure, various bushings 26, bearing cages 27, supporting disks 28 and a knob (mounting button) 29 being selected as supplementary equipment, if needed.

A dosing motor 31, actuatable by a micro switch 30, is eccentrically disposed in the additional structure and drives on top of said additional structure a crank shaft 32, crank 33 of which is designed to from below mesh with a shuttle 34, which belongs to a dosing mechanism 35, which is disposed at the lower end of a package (not shown), which contains e.g. coffee granules or powder, chocolate, tea or the like and which is inserted into an opening 36.

It is shown in the drawings, that in the shown embodiment there are six openings 36, which are arranged in a star-like fashion around hub 37 of the rotating plate and inside the periphery of the rotating plate, which periphery comprises an upwardly directed bead 38 all around, which terminates downwards and outwards with a flange 39 with recesses 40, e.g. open downwards and laterally, at least one of which being designed in a certain special way in order to make the exact position of the rotating plate detectable by means of not shown electronic and/or mechanical sensor elements.

Between openings 36 spoke-like beads 41 can extend radially between the hub and the flange, which beads are formed e.g. by pressing the sheet material of the rotating plate upwards. In this way a reinforcement and a stiffening of the rotating plate is obtained.

Openings 36 have a rectangular shape and contain a dosing mechanism 35 with a tight fit, only the lower part of which being shown in the drawings. This lower part is fastened in the opening in a suitable way, e.g. by means of flanges and bearing edges, which makes it easy to quickly and simply replace an empty package with a new one, said lower part being able to remain in the opening and only the upper part of the dosing mechanism being replaced jointly with the accompanying package or a complete replacement including the lower part being possible, depending on the desires of the customer, the sanitary requirements, the nature of the ingredients, etc.

Each dosing mechanism 35 comprises a downwardly directed spout 43, which extends close to flange 39 from a funnel-like upper part 42 and is designed to, when a respective package has been chosen, end up above a cup, into which the ingredients are to be dispensed.

Shuttle 34 comprises two transverse carrier walls 44, at least one of which, i.e. the inner one, being disposed roughly concentrically, i.e. along a circular arc around hub 37. The outer wall may be straight or tangential in relation to a circle, which is tangential to it, with the hub as a center. Carrier walls 44 form between them a guide gap 45, with which crank 33 is designed to mesh. The shuttles of all the dosing devices have carrier walls and guide gaps, disposed along the same circular movement path, which means, that the rotating plate always positions the carrier walls of a shuttle on each side of crank 33, only one dosing motor being required for an optional number of dosing mechanisms. A straight design of outer wall 44 facilitates the steering of the crank into the gap.

A mounting plate 46 in the house is designed for a lock 47 as well as a support for a hose (not shown) from a container (not shown) for e.g. hot water.

In Fig 2 it is also shown, that a control panel 48 can be fastened in or to the front side, which panel has various buttons 49 for choosing the desired beverage and ingredients added to it. Behind the front side there are various mounting and covering plates 50, 51, 52 designed for e.g. a printed circuit card 53 and wiring 54. Behind panel 48 there are electrical connections 55. The entire front side 2 including panel 48 suitably is fastened to the house by means of a hinge 56.

Such a beverage dispenser functions in the following way :

10 A cup or the like is placed in opening 11 of the dispenser on surface 10 and the desired beverage with added ingredients, e.g. sugar and cream substitute is chosen via buttons 49. In case the dispenser is designed as a vending machine, there is within the area with an opening 57 in front side 2 a payment mechanism having a slot for coins or tokens, known per se. In the case shown the dispenser is not designed for paid beverages and opening 57 is covered by plate 52.

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Signals fed into the dispenser via the buttons are transduced via printed circuit card 53 to driving motor 23, which via drive gear 18 and drive belt 17 rotate driving pulley 16 and consequently also via spindle 24 rotating plate 25 to first of all the appropriate positions for a desired package with its dosing mechanism 35 above the cup on cup surface 10. The positions of the separate package are detected during the rotation of the rotating plate by said sensors or the like by means of one or several recesses 40. In this way the driving motor will be stopped in the intended dispensing position.

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Dosing motor 31 is then started and it rotates crank 33 a selected number of times, which is controlled by means of micro switch 30, the projecting arm 58 of which being influenced by crank shaft 32 during each completed turn. In this way shuttle 34 is moved to and fro the selected number of times and each time a certain amount of the contents of the package is dispensed via spout 43, centrally disposed above the cup, and then into the cup or the like. Thus, crank 33 moves along the appropriate guide gap 45 and moves the shuttle via carrier walls 44 to and fro. Before and after the rotation of crank shaft 32 crank 33 stops in the middle of guide gap 45 and the position of the shuttle in relation to dosing mechanism 35 is one of the end positions, which is common for all the dosing mechanisms. This means, that the carrier walls and the guide gaps of all the dosing mechanisms are positioned along the same respective circular path, the rotating plate being rotatable to an arbitrary extent, the shuttles not being influenced. However, guide gaps 45 always are moved, crank 33 being surrounded, which consequently always immediately can move a shuttle, when this together with its dosing mechanism and package is stopped in the dispensing position.

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When the ingredient and perhaps several ingredients respectively and the admixtures respectively have been dispensed into the cup or the like, it is suitable to rotate the rotating plate half a division between adjacent packages, where hot water is added, in order to avoid that at least not directly  
5 water vapor will be able to stream upwards into the pipe just used and condense on its interior side or higher up in the mechanism or the package.

Subsequent to such a use cycle the rotating plate suitably returns to a certain selected starting position or it returns in connection with the starting of the next cycle.  
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It is also evident from the drawing, that it is easy to maintain a beverage dispenser according to the invention and keep it clean. The rotating plate can be disassembled quickly and in a simple way for e.g. cleaning and filling with new packages respectively. However, a filling suitably is carried out on the rotating plate, when it is mounted on the dispenser house and only must be rotated into the  
15 desired replacement position.

The invention is not limited to the embodiments described above and shown in the enclosed drawings, which embodiments can be modified and supplemented in an arbitrary manner within the scope of the inventive idea and the following claims.  
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**CLAIMS:**

1. A beverage dispenser (1) which comprises a house (2-6) and in this house disposed, optionally selectable packages with ingredients for making beverages, which ingredients are to be dispensed in cups or the like via dosing mechanisms (35) with shuttles (34) to be moved to and fro and simultaneously a certain amount of ingredients to be dispensed, **characterized in that** the dosing mechanisms (35) and the corresponding packages are disposed in a star-like fashion in and on respectively a motor-driven rotating plate (25), in that the shuttles (34) each one is provided with two roughly transverse carrier walls (44), which define between themselves a guide gap (45), into which a crank (33) of a crank shaft (32) is designed to penetrate, which crank shaft is connected to a dosing motor (31), and in that in all of said shuttles (34) at least one, preferably the inner, carrier wall (44) and the guide gap (45) respectively follow circular paths, which are concentric in relation to the hub (37) of the rotating plate (25).
2. A beverage dispenser according to claim 1, **characterized in that** the interior components of the dispenser (1) from below and upwards comprise first of all one or several drip trays, preferably a lower U-shaped drip tray (7) for liquid and above it a similar upper tray (8) for powder or granular waste, the lower tray (7) being supported by the bottom side (6) of the house and the upper tray (8) being supported by an upwardly directed edge (9), which surrounds the lower tray (7), and including an e.g. latticed bar-like surface (10) to place cups or the like on, which can be inserted into the house via an opening (11) in the front side (2) of the house.
3. A beverage dispenser according to claim 2, **characterized in that** on the bottom side (6) of the house a base plate (12) is disposed, which preferably shape-complementarily is surrounded by said trays (7,8) with their legs and webs, which plate has a substantial thickness, because its sides (15) are bent downwards in order to provide space for e.g. nuts, screws and the like but also for a driving pulley (16), which is designed to rotate the rotating plate (25) and is disposed in a horizontal plane, which pulley has a relatively large diameter and is driven via e.g. a belt (17) by means of a drive gear (18) having a relatively small diameter, in that the driving pulley (16) is disposed immediately behind the front side (2) of the house and in that the drive gear (18) is disposed immediately inside the back side (4) of the house.
4. A beverage dispenser according to claim 1 and 3 respectively, **characterized in that** on top of the base plate (12) there is at a short distance behind the front side (2) of the house an additional structure (19), which is relatively high, e.g. 15 cm, and which preferably somewhat displaced inwards follows the outline of the base plate within this area, the edges, which face the



front side, preferably being replaced with bevels (20), which also can be provided (at 21 and 22 respectively) on the base plate and the trays (7, 8) respectively and are designed to obtain an expedient design and an improved stability of said parts, and/or in that on the rear part of the base plate a driving motor (23) for said driving pulley (18) is centrally disposed, whereas a spindle (24), which is directed upwards from the driving pulley (16) is centrally disposed within the additional structure, which spindle transfers the rotation of the pulley to the rotating plate (25), which is disposed on top of the additional structure.

5. A beverage dispenser according to any of claims 1-4, **characterized in that** in the additional structure said dosing motor (31), which is to be actuated by a micro switch (30), is eccentrically disposed, which dosing motor drives said crank shaft (32), disposed on top of the additional structure, and the crank (33) of which is designed to from below mesh with said shuttle (34), which belongs to a dosing mechanism (35), which is disposed at the lower end of a package, which contains e.g. a coffee granulate or powder, chocolate, tea or the like and which is introduced into an opening (36) in the rotating plate (25).

6. A beverage dispenser according to any of claims 1-5, **characterized in that** e.g. six openings (36) in a star-like fashion are arranged in the rotating plate around its hub (37) and inside the periphery of the rotating plate, the periphery comprising a flange (39) having e.g. downwardly and laterally open recesses (40), of which at least one is designed in a certain special way in order to make it possible to detect the exact position of the rotating plate, e.g. by means of electronic and/or mechanical sensor elements, in that said openings (36) are rectangular and each one houses with a tight fit a dosing mechanism (35), only the lowermost part of which being fastened in the opening, e.g. by means of flanges and support edges to allow easy, quick and simple replacements of empty packages with new packages, said lowermost part preferably being designed to remain in the opening and only the upper part of the dosing mechanism being designed to be replaced jointly with the corresponding package or a complete replacement including the lowermost part being designed to take place and/or in that each dosing mechanism (35) comprises a downwardly directed spout (43), which projects from a funnel-like upper part (42), which spout is designed to end up above a cup, into which the ingredients are to be dispensed.

7. A beverage dispenser according to any of claims 1-6, **characterized in that** the beverage making is to take place by introducing a cup of the like in the opening (11) in the dispenser on a placement surface (10), in that the desired beverage and admixtures, e.g. sugar and a cream substitute, are to be chosen via control buttons (49) on the front side (2), in that signals sent via the buttons are to be transmitted via a printed circuit card (53) to the driving motor (23), which

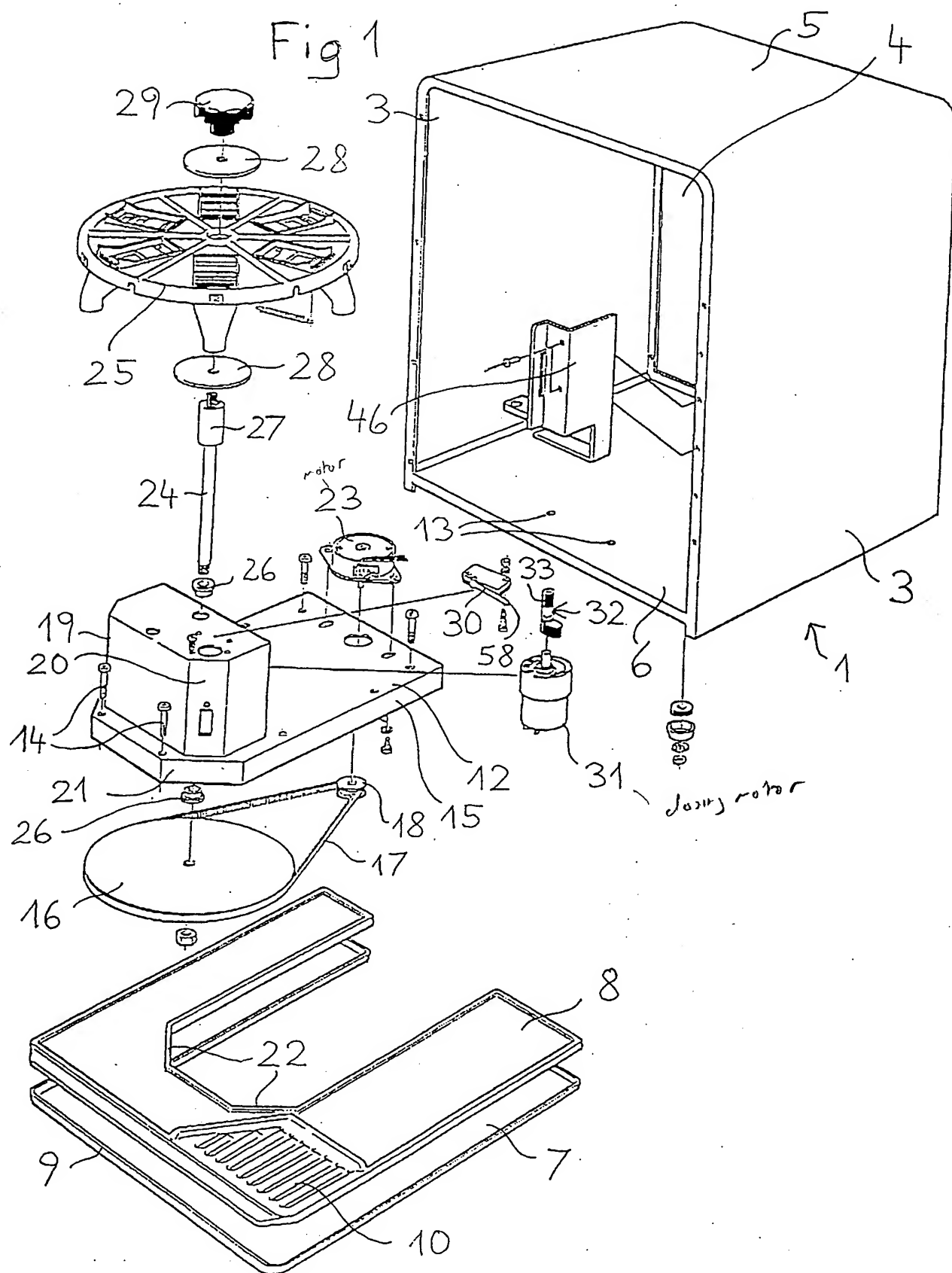
via the drive gear (18) and the drive belt (17) are to rotate the driving pulley (16) and consequently via the spindle (24) also the rotating plate (25) to first of all the selected position for the desired package with its corresponding dosing mechanism (35) above the cup, placed on said surface (10), and in that the positions of the various packages can be detected during the rotation of the rotating plate by means of said sensor elements or the like using one or several of said recesses (40) in order to allow the driving motor to stop in the selected dispensing position.

8. A beverage dispenser according to claim 7, **characterized in that**, when the rotating plate (25) has stopped in the selected dispensing position, the dosing motor (31) will start and rotate the crank (33) a selected number of times, which will be monitored by the micro switch (30), the projecting arm (58) of which will be actuated by the crank shaft (32) during each completed turn in order to move the shuttle (34) to and fro a selected number of times and to each time dispense a certain amount of the contents of the package via the spout (43), centrally disposed above the cup, into the cup or the like, the crank (33) being designed to be moved along the selected guide gap (45) and move the shuttle via carrier walls (44) to and from, and in that before and after the rotation of the crank shaft (32) the crank (33) is to be stopped in the middle of the guide gap (45) and the position of the shuttle in relation to the dosing mechanism (35) will be one of the end positions, which is the same for all of the dosing mechanisms.

9. A beverage dispenser according to claim 8, **characterized in that** when the ingredient and in some cases the ingredients respectively and the admixtures respectively have been dispensed into the cup or the like, the rotating plate will be rotated half a division between adjacent packages in order to add hot water in this position, preventing and counteracting that water vapor at least not directly will rise in the spout just used and condense on its interior side or higher up in the mechanism or the package, and/or in that subsequent to a use cycle the rotating plate will return to a certain defined starting position or such a return is to take place in connection with the beginning of the next cycle.

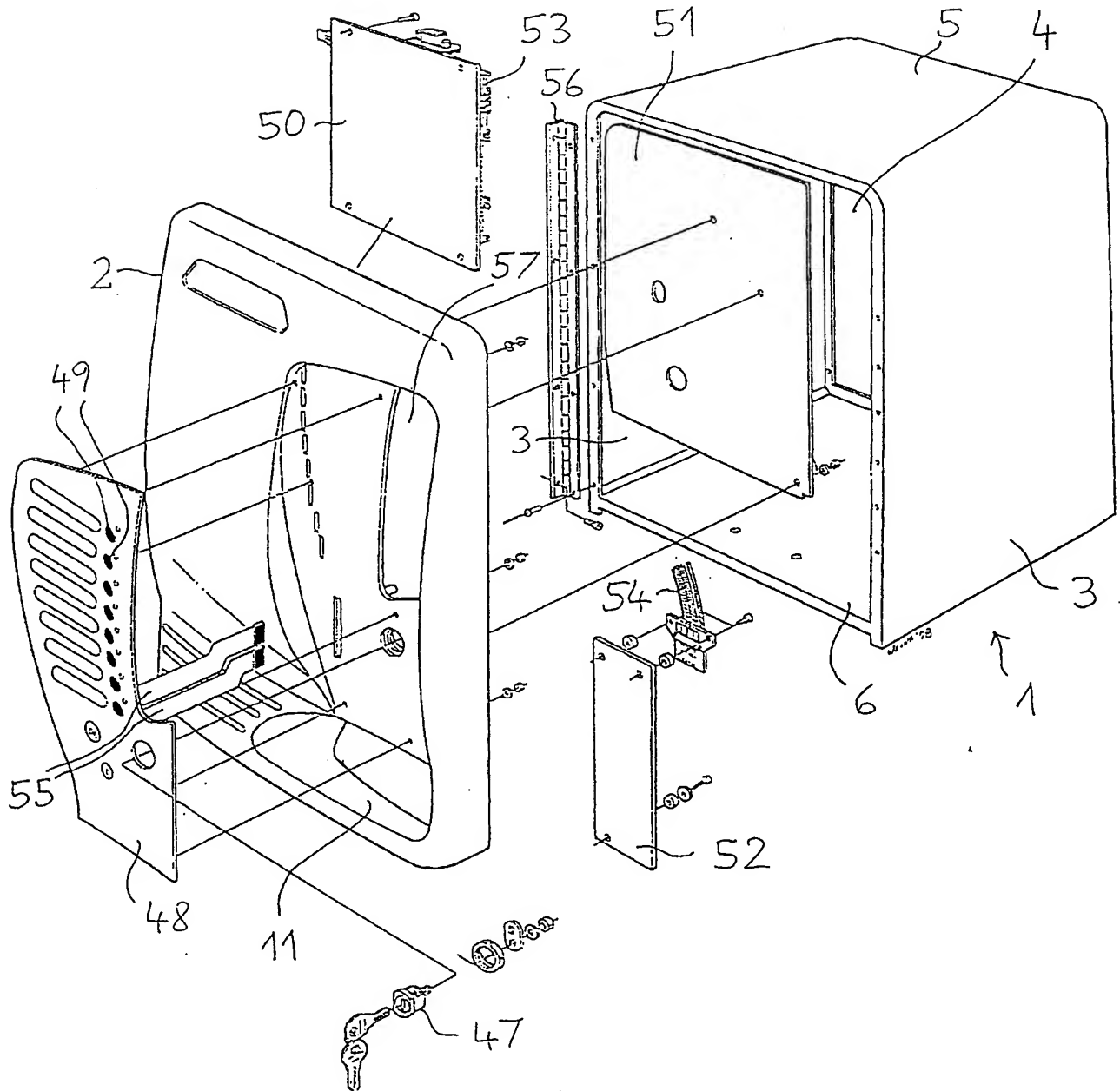
10. A beverage dispenser according to any of claims 6-9, **characterized in that** the rotating plate of the beverage dispenser can be disassembled in a simple and quick way in order to e.g. clean it and insert new packages respectively, which insertion however suitably will take place on the rotating plate, when it is fastened in the dispenser house, which rotating plate for this purpose can be rotated to the desired replacement position.

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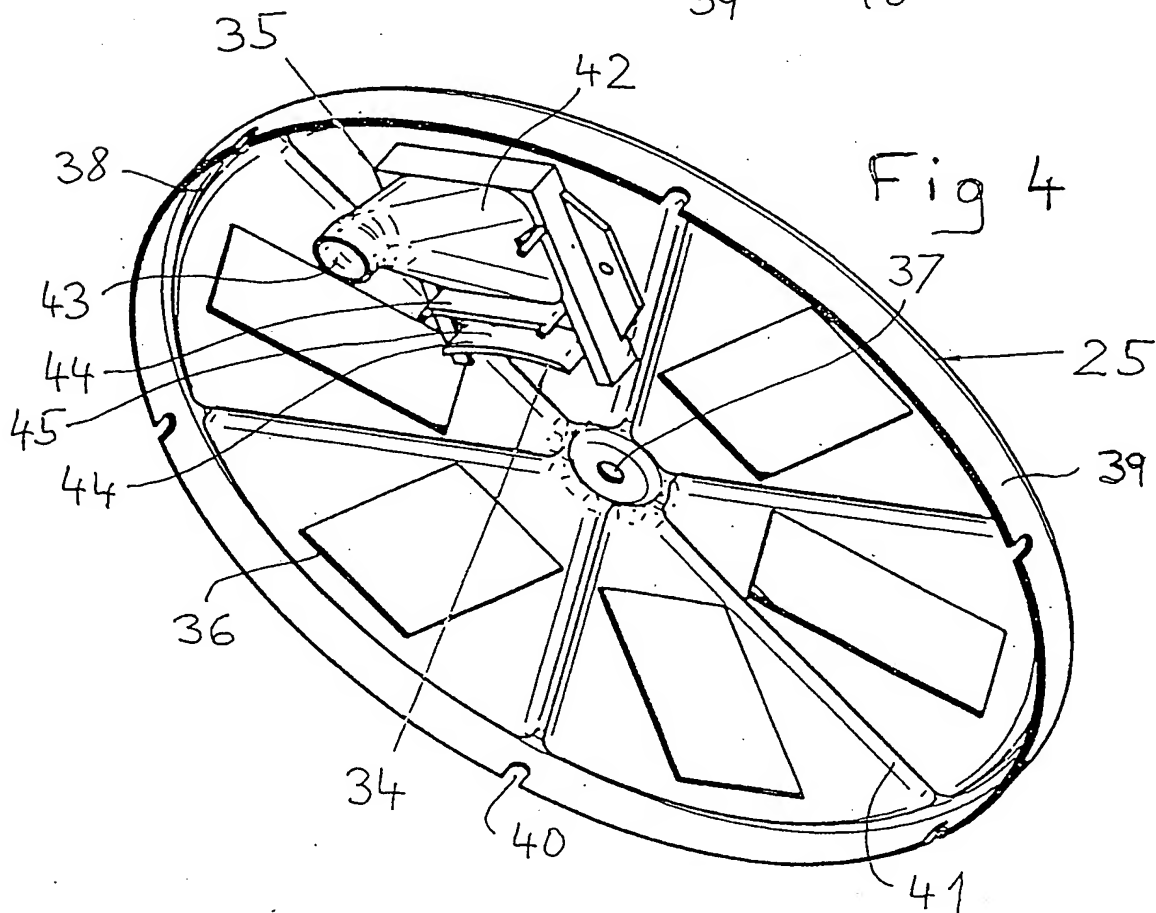
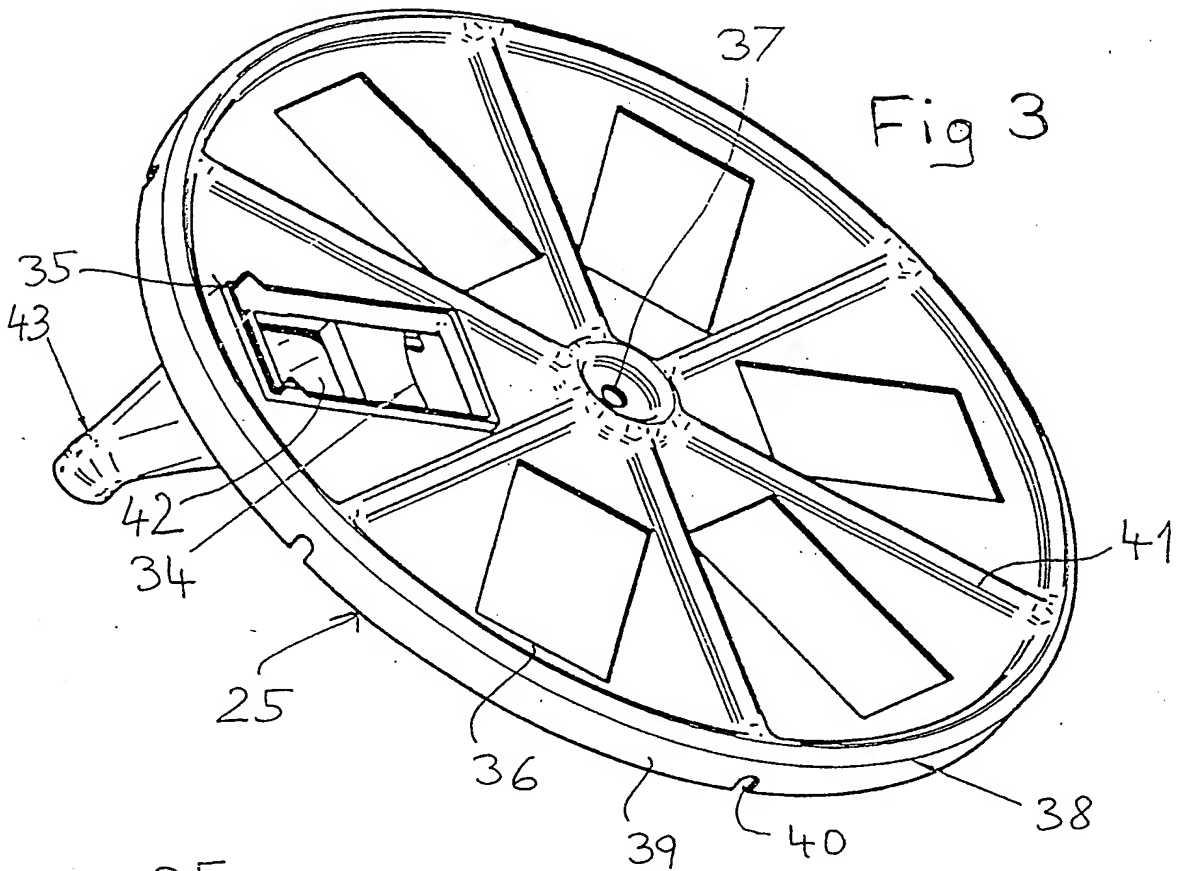


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Fig 2



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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 99/01918

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A47J 31/40

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4829889 A (TAKEUCHI ET AL), 16 May 1989 (16.05.89), figures 1-29, claims 1-21 --	1-10
A	EP 0886249 A1 (PREMARK INTERNATIONAL HOLDINGS B.V.), 30 October 1997 (30.10.97), figures 1-3, claims 1-4 --	1-10
A	EP 0270141 A1 (GROSSI, LUCIO), 12 October 1987 (12.10.87), figures 1-7, claims 1-15 -----	1-10

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

02/12/99

International application No.  
PCT/SE 99/01918

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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